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Daix, Nicolas

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ABOUT HUMAN INTERNAL MIGRATION AND DEVELOPMENT IN SOUTHERN PHILIPPINES MARGINALIZED AREAS

Nicolas Daix[1]

[1]University of Namur, Department of Geography, FUNDP, Belgium

Abstract

Given that marginality plays an obvious role in the economical and human development, we assume that marginalized areas can not, by their own status, fully participate to the local economy. We define marginalized area as area with low transport facilities, no/poor ability to negotiate with economic and/or political actors, lack of basic infrastructures and, as a consequence, a manifest poverty. However, although such areas do not seem to be adequate for livelihood development, some of them attract many people. In fact, migrations are an alternative survival strategy in the Philippines and in particular internal migration. Due to some specific characteristics Mindanao Island (Southern Philippines) is of the most attractive regions of the Philippines, while remaining one of the most marginal. In this paper we assess the influence of internal migration on (i) land use and (ii) marginality in Agusan del Sur Province (Mindanao). At provincial and municipal level, we compare the evolution of migratory pressures with land use data and marginality indicators. We also use two Landsat images taken in 1976 and 2001 and original data from a social survey (2006) to consolidate our results. Our study correlates the attractiveness' reasons of the study area with the observed land use changes since 30 years ago. Remote sensing processes of the Landsat images show local agricultural colonization spots. A set of clues indicate that internal migration is a key factor of such changes.

Keywords: marginality, internal migration, rural, Principal Component Analysis.

1. Introduction

The detection of the most marginal areas in a given space is an essential phase in a process of development. Indeed, it is in these areas that economic or infrastructural malfunctions might be the most symptomatic. Many studies are based on global indicators such as the human development index (HDI) or the human poverty index (HPI) (UNDP, 1997), but these indicators are just too few suitable for analysis at a large scale. In the Philippines, some indicators were calculated at the scale of the municipality, but not below. We therefore propose several methodologies to assess the degree of marginalization of a community at the local level (at the barangay and / or purok level). A barangay is the smallest local government unit in the Philippines and is very similar to a village. A barangay is composed of several puroks which could be identified as small districts.

2. Definitions of marginality and marginalization factors

We must clearly distinguish marginalization and poverty. Poverty is a fact while marginalization is a process; a marginalized community is not necessarily poor. The opposite is less obvious. It is possible that a group of individuals lives in an isolated place and has a good standard of living. Simmel (1998) had already noticed in 1908 that the poor populations were not all marginalized. The marginality can also be considered as the result of a loss of social connections. Gurung and Kollmair (2005) note that the marginality is generally used to describe and analyze the sociocultural, political and economic spheres, where the underprivileged people endeavour to obtain an access (societal or spatial) to the resources and a full participation in the social life. In other words, the marginalized groups can be ignored and excluded socially, economically, politically and legally excluded and, so to be more vulnerable (Müller-Böker and al., 2004). IGU (*in* Gurung and Kollmair (2005)) defines the marginality as the (temporary) state of relative isolation at the edge of a given system. Sommers and al. (1999) define the socio-economic marginality as a socio-spatial context leading a territorial unit to an economic, political and social under-performance compared to the whole of the territory.

Gurung and Kollmair (2005) distinguish *societal marginality* (weak social conditions) and *spatial marginality* (insulation of the economic centers for lack of suitable infrastructures). Societal marginality is by and large reflected on the underlying social conditions of people. The conditions are represented by poor livelihood options (lack of resources, skills and opportunities), reduced or restricted participation in

public decision-making, less use of public space, lower sense of community and low self-esteem. Marginalised people are usually discriminated against, stigmatized, ignored and often suppressed by the mainstream on the basis of race, gender, age, culture, religion, ethnicity, occupation, education and economy. The dimension of spatial marginality is usually linked to the geographical remoteness of an area from major economic centres (location), and refers to areas that are difficult to reach (access) in the absence of appropriate infrastructure and therefore isolated from mainstream development. According to Leimgruber (2004), a marginal region is defined as an area lying at the edge of a system. Hence, spatial marginality indicates the relative distance from economic and service centres, but regional disparities might persist nationally at different scales regardless of geographical remoteness.

Mehretu and al. (2000) propose a taxonomy of the marginality. They distinguish four types of marginality: *contingent, systemic, collateral and leveraged.* A brief description and the spatial structures resulting from these various marginalities are included in *table 1*. Subirats and al. (nd) identify, in addition to certain factors quoted herebefore, some marginalization factors of marginalisation at the individual level. A small degree of education, a higher age, the period of fertility at the woman, physical handicaps, a bad health, the deterioration of the livelihood environment can lead to a situation of marginality.

	Scale of Analysis		
Types of marginality	Macro	Micro	In situ
Contingent	Core/periphery disparities on account of distance decay, cultural barriers to diffusion, and market imperfections	Central city abandonment and marginalization by suburban hedonism (hedonistic metropolitan enclaves)	"Gated" or "walled" communities within urban neighbourhoods to maintain desired and uniform housing stock and other residential characteristics.
Systemic	Core-periphery disparity resulting from hegemonic (antagonistic and dependency driven) development process	Hegemonic containment of inner city neighbourhoods (red-lining, outcast ghetto)	Segregation: racial, ethnic, cultural, class-based, age-based (restrictive residential covenants).
Collateral	Regional negative contagion effects (negative externalities) from systemically marginalized people on those who do not share the same vulnerabilities (development loans, FDI, etc.)	Subregional negative contagion effects (negative externalities) from marginalized people on those who do not share the same vulnerabilities (inadequate social and economic infrastructure, pollution, institutional decay)	Small-area negative externalities experienced by people who reside in marginalized neighbourhoods but do not share the same vulnerabilities (predicament of early gentrifyers).
Leveraged	TNC-led "downward wage levelling", outsourcing, subcontracting, union-busting using systemically marginalized low-wage labour pools in LDCs	Metropolitan housing stock turnovers due to differential market bidding between low-income and high-income households mediated by real estate establishments (arbitrage in housing markets)	Real estate manipulation of local housing markets by using arbitrage in block-busting and similar changes in diverse neighbourhoods

Table 1: Four types of marginality [Source: Mehretu et al. (2000)]

2. Marginality indicators

2.1. Human Poverty Indexes

United Nations developed two indexes of human poverty (HPI) (UNDP, 1997). These composite indexes are based on the same principle as the index of human development (HDI). The HPI measures the gaps in following dimensions: life expectancy and quality of life, knowledge and social integration. HPI-1 is calculated thanks to the following formula:

$$\text{HPI-1} = \left[\frac{\left(P_1^{\alpha} + P_2^{\alpha} + P_3^{\alpha}\right)}{3} \right]^{1/\alpha} \qquad (1)$$

where $\alpha = 3$, P_1 is the probability at birth of not surviving to age 40, P_2 is the adult illiteracy rate and P_3 is the simple average of (a) the proportion of individuals not having a durable access to water and (b) the percentage of children under weight for age.

The higher the value of these indices HPI-1 is (for a spatial entity), the poorer this entity is.

2.2. PCA-methods

Several authors have developed methods to assess the marginality level of spatial entities by using eigenvalues from Principal Components Analysis (applied to socio-economic and spatial variables).

Oliveau (2004) built an index of modernization which integrates an *index of enclavement* applied to Southern India. His methodology consists in highlighting the correlation between variables such as working population, sex-ratio in the working population, numbers of owner among the working population, working population employed in the primary sector (%), illiteracy rate, fecundity rate, irrigation rate, road density, etc, using a principal components analysis (PCA).

In the nineties, the Mexican government (CONAPO) developed, within the framework of an anti-poverty program in urban environment (PROGRESA), an index of marginality also based on PCA outputs. This index is using seven variables resulting from the censuses from 1990 and 1995. The main idea of this index is (i) to apply a PCA to the seven variables and (ii) to weight by the eigenvectors of the first component each variable in the index. The index of marginality for a unit of analysis *j* is (according to Cavatassi and al. (2004) :

$$\text{Marginality Index}_{\ j} = \sum_{k=1}^{n} f_k \frac{\left(a_{jk} - m_k\right)}{s_k} \qquad (2)$$

where f_k is the factorial score of the variable *k*, a_{jk} is the value of the variable *k* for the household *j*, and m_k and s_k are the average and standard deviation of the variable *k* for all the households. The higher the value of this index is, the higher the marginality is.

Other authors used other statistical outputs, like multiple correspondence analysis, to build poverty or marginality indicators (Asselin (2002), Ki (2005) and Ningaye and Ndjanyou (2007)).

3. Study area

The study area is Agusan del Sur Province (ADS), about 9000 square kilometres, located in the Caraga region (Region XIII) in the North-West part of Mindanao, the Philippines. Agusan del Sur is an elongated basin formation with a central longitudinal valley surrounded by eastern and western mountain ranges. The Agusan River runs almost northward in the middle of the valley. Agusan Marsh, one of the most ecologically significant wetlands in the Philippines, occupies the central area of the basin. Forestland constitutes about 75% of the total land area while the alienable and disposable (A&D) constitutes 25%. Climate has no dry season with very pronounced wet season of heavy precipitation. Maximum rainfall generally occurs from December to January.

Mindanao is the second larger island of the country with about 18 million inhabitants, which represents 24% of the national population. The population of ADS was 560 thousands at the 2000 census for 104 thousands households. The population density is 62 persons per sq km. 27 % of the population lives in urban areas. The province is composed of 13 municipalities. About 170,000 has (20% of the total provincial area) are used for agriculture, permanent or temporary crops. Other activities are commercial logging and plantations.

4. Calculation of marginality indexes in Agusan del Sur

Some results of marginality assessments in the Philippines and in the province of Agusan del Sur in particular are presented below. First, the results for the Human Poverty Index (HPI-1) are presented and then, the marginality values obtained with a PCA-method at the level of the barangay within ADS.

Ducanes and Balisacan (2005) calculated the value of HPI at provincial scale in the Philippines in 2002. The value for the province of Agusan del Sur is 23.1 (rank: 14/78) and the national value is 18.4. ADS is one of the poorest provinces in the Philippines. The same calculation of HPI-1 was made by ESSC (Environmental Science for Social Change) in 2005 at municipal level. The West part of the province of Agusan del Sur (ADS) – where the municipalities of San Francisco and Rosario are localised – have relatively high value (more than 30) (see figure 2), given that the average of Philippines is of 15.3 in 2004 (*medium human development*) (RDH, 2006).

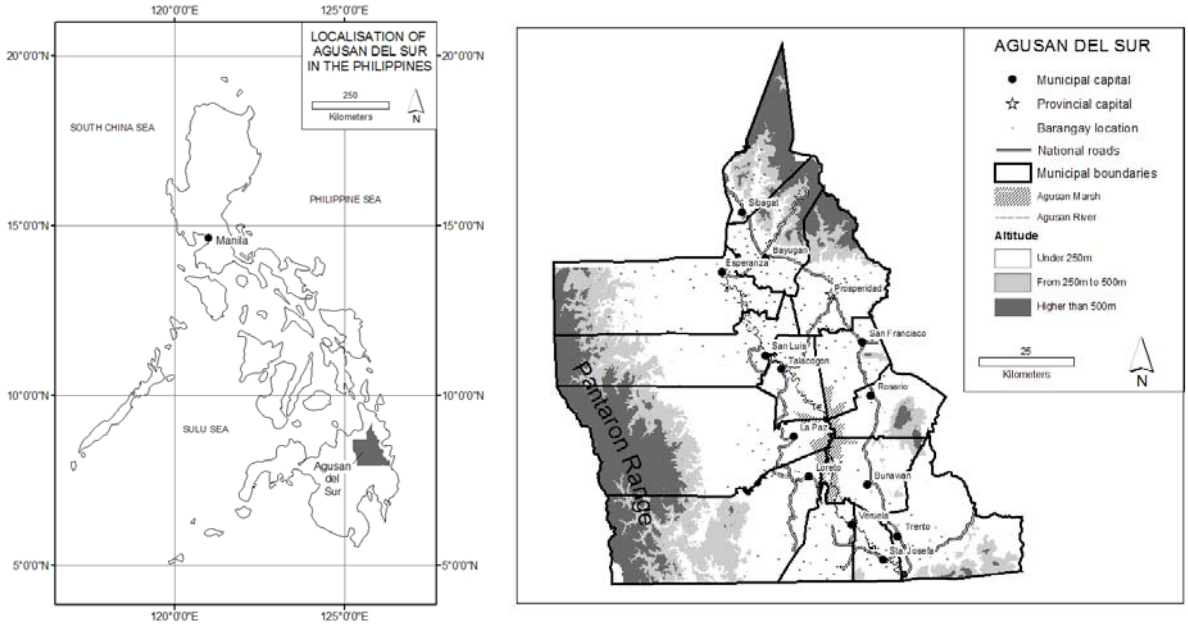

Figure 1: Localisation of Agusan del Sur in the Philippines

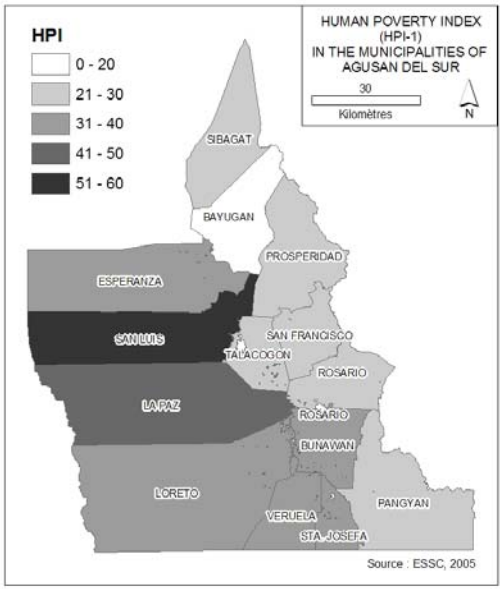

Figure 2: HPI-1 values in the municipalities of Agusan del Sur (ESSC, 2005)

The variables of HPI-1 (e.g. the probability at birth of not surviving to age 40) are not recorded in the available database (CBMS). However, the use of *proxy variables* from this database permits the assessment of a proxy HPI-1 (see equation 1) at the barangay level. The proxy variables used are: Members of 60 years and above/Total Population for P_1, Illiterate persons 10 y. old and above/Population of 10 y. old and above for P_2 and Households with access to safe water *and* Malnourished children 0-5 y. old for P_3. Note that the value range of HPI-1 and its proxy is different. Figure 3 shows the mapped results at the barangay and the municipal levels. The value of proxy HPI-1 for a municipality is the average of the barangays values of this municipality.

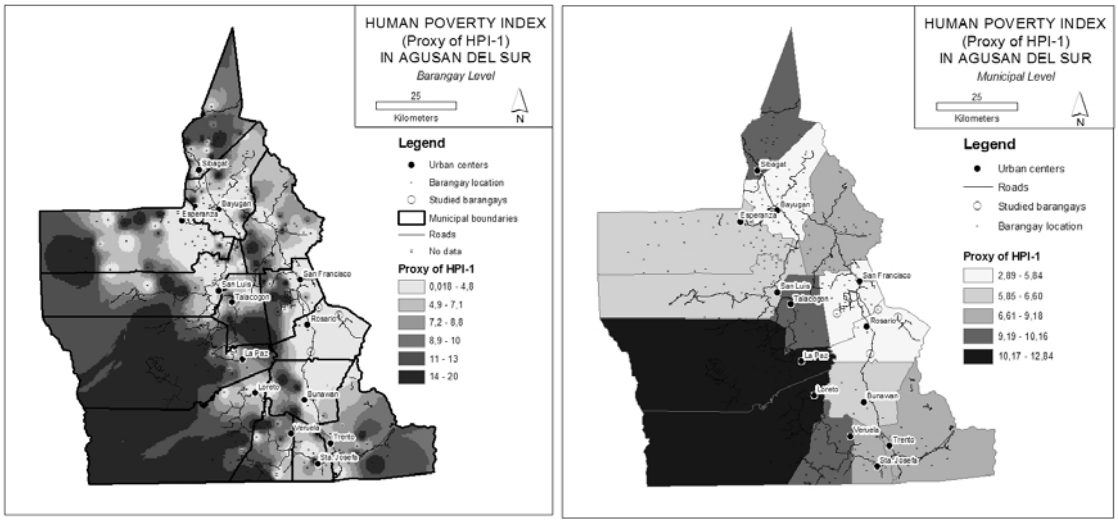

Figure 3: Proxy HPI-1 values in Agusan del Sur (barangay and municipal levels)

The comparison of the three maps (figures 2 and 3) shows clearly that the eastern side of ADS is less poor than the western part. The role of road seems obvious. The North-South road crossing the cities of Trento, Rosario, San Francisco, Prosperidad and Bayugan has a significant influence on marginality degree of areas close to the road. The map at the scale of the barangays (left on figure 3) highlights the spatial heterogeneity within the municipalities. Some spots correspond to local place with high poverty values.

We used data from the CBMS (Community Based Monitoring System) of 2005 in order to assess the marginality level within Agusan del Sur. CBMS is a transnational investigation at the puroks scales. The 14 core indicators cover the following themes: health, nutrition, shelter, water and sanitation, education and literacy, income, employment and peace and order. We have directly conducted a PCA on these 14 indicators to calculate the ${}^{PCA}M$ index (see paragraph 2.3. equation 4). Figure 4 shows the values of this index. Note we used an *inverse distance weight* interpolation (IDW) to present the data continuously in the space.

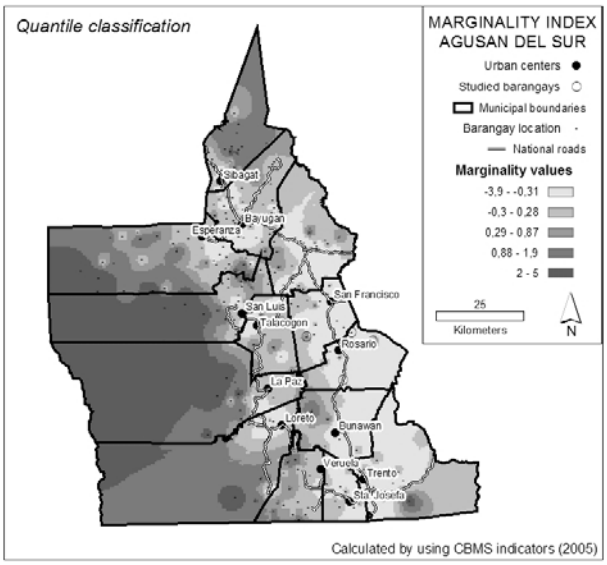

Figure 4: Marginality index in Agusan del Sur (2005)

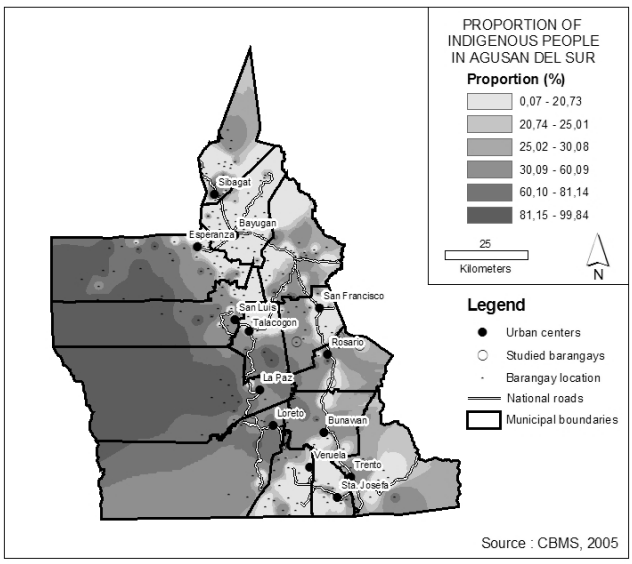

Figure 5: Proportion of Indigenous People in Agusan del Sur (2005)

5. Assessment of migratory pressures in Agusan del Sur

From about 38.000 people in 1948, raised 560.000 in 2000. Two inflection points in the evolution of the provincial population can be highlighted: the first one in 1960 and the second one at the beginning of the 80s. These periods might correspond to immigration waves towards ADS Province. The demographic growth has indeed not been constant during the period 1948-2000.

The assessment of migratory pressures within the province of Agusan del Sur is difficult because there are no internal migrations data at infra-regional level. *A fortiori* there are no temporal series of such data. Few authors have realized some studied but none at infra-regional level due to the lack of data (see for example UNFPA-NCSO (nd.); Flieger, 1996; Orbeta and Pernia, 1999). Approximation of immigration volume could be carried out on the basis of the crude rate of natural increase (CRNI). The CRNI of ADS was calculated for the years 1990 (23.6 ‰) and 1995 (16.7 ‰) on the basis of data from National Statistics Office and Bureau of Labour and Employment Statistics. By applying this natural growth rate to the actual population in 1990, it is possible to estimate the volume of immigrations between 1990 and 2000 by the difference between (i) the total population and (ii) the population resulting from natural increase. So, the volume of immigrants can be estimated at about 300.000 people during the 90s.

Nevertheless, some data at the municipal level are available. For example, the evolution of the population in La Paz from 1918 to 2005 speaks of the migration trend situation of the municipality. Between 1970 and 1975, the population increased sharply, passing from 7,971 to 12,634 people. This marked increase is due to the influx of migrant workers attracted by labor demands of forest resource-based industrial establishments. Out-migration happened when these establishments slow down, if not ceased operations, some years later. This period marked the abrupt decline in population growth rate mainly due to the deterioration of the local peace and order situation. As stability of peace and order situation was regained in the 1980s, in-migration increased and steadied the annual growth rate of the municipality. When total log ban was implemented in the municipality, people out migrated to look for opportunities (CLUP of La Paz, nd).

CBMS database gives the number of indigenous people and this variable is available at the barangay scale. Therefore an intra-provincial analysis could be done. Indigenous people (IP) proportion is considered here as a proxy variable of immigration. In fact, we consider that a place with a high proportion of IP is a place that has not experienced immigration flows in the past. In this way, the map of the proportion of indigenous people in each barangay of Agusan del Sur in 2005 (Figure 5 above) is an indicative map of migratory pressures throughout the province.

6. Assessment of land use change

Statistics about the land use change at the intra-provincial scale are very hard to get. The most accurate available data come from the agricultural censuses every decade since 1971. With these data, it is possible to assess the evolution of different land uses (forest, agriculture, meadows, etc.) or activities and/or products (cereals, fruits, etc.). For example, the number of farms in ADS grew double by 30.000 between 1971 and 2002 while the cumulated surface of farms was multiply by 4 during the same period. The crop planted area (temporary or permanent) tripled during this period in the province, increasing from about 60.000 ha. to more than 180.000 ha. Such statistics demonstrate a rising demand for land linked to significant land use changes.

The use of remote sensing data will help in assessing the land use change within the province. According to Landsat images, the difference between two Normalized Difference Vegetation Indexes (NDVI) computed in 1976 and 2001 shows significant land use changes within agricultural colonization or plantation sites. Berbers (2007) identifies deforestation sites within the province of ADS, based on land cover classifications in 1987 and 2004. Figure 6, hereafter, show the results of these analyses. The comparison of aerial photos taken between 1979 and 1982 and very high resolution satellite images taken in 2002 have confirmed the important deforestation rate in ADS especially along the waterways. A set of clue shows that ADS has known a pioneer migration while the environment is rather repulsive. For example, some colonized areas (see figure 6) cover potential flood areas (Agusan Marsh).

7. Comparisons Migrations – Marginality – Land Use change

The pressures on the environment seem obvious. Maps presented above show land use changes especially along the west side of the national road. The map of *plantation and cultivated areas* (Figure 7 below) tends to confirm that such changes are due to agricultural and commercial plantations, which occurred since the eighties. The figure 5 suggests that the places with low proportion of IPs, considered as places with high proportion of migrants, are located where deforestation and cultivation/plantation are the most important.

A correlation between the proportion of indigenous people and the degree of marginality in 2005 is not obvious. Globally, in the eastern part of the province, along the highway, the barangays seem to be less marginalized (figure 4) but migratory pressures seem experienced in areas which, although localized in the eastern part, are not particularly close to the highway. This is the case in the municipality of Veruela and to the west of Prosperidad, where we may observe high rate of in-migration and high marginality.

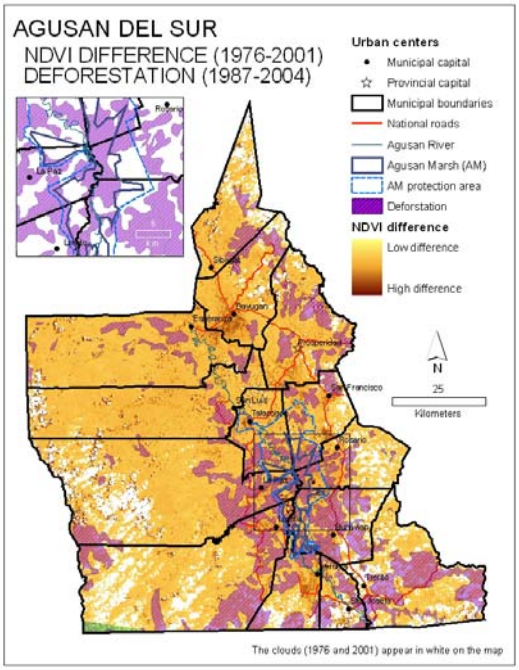

Figure 6: NDVI and deforestation

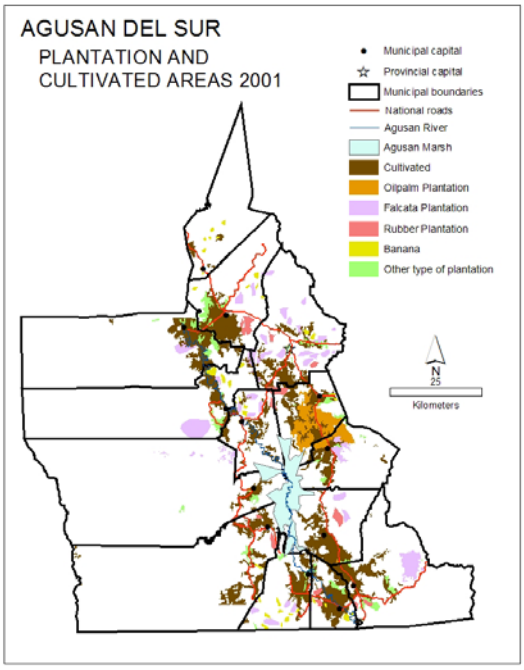

Figure 7: Plantation and Cultivated areas

8. Conclusion and perspectives

The population marginality and the land use observed today within the province of Agusan del Sur is partially correlated to its migration history. The emerging agri-business, the implementation of agrarian reforms, the commercial activities, the availability, the suitability and the rate of land appear as many factors influencing migration, marginality and land use. A social survey conducted in several sites might help in better locally understand these factors. The data collection and their analysis will provide the opportunity for a possible modelling of the real influence of human migration on development.

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